

REMARKS

Status Of Application

Claims 1-20 were pending in the application. By this amendment, claim 21 has been added. The status of the remaining claims is as follows:

Claim 18 is rejected under 35 U.S.C. § 112 second paragraph because the definition of the phrase "a two-value image" is not clearly stated in the claim;

Claims 1, 8-11 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,320,562 to Ueno et al (hereinafter the "Ueno patent");

Claims 2-7 and 12-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ueno patent as applied to claim 1, and further in view of U.S. Patent No. 5,748,277 to Huang et al (hereinafter the "Huang patent");

Claim 15-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ueno patent taken with the Huang patent as applied to claim 14, and further in view of U.S. Patent No. 6,069,603 to Knapp (hereinafter the "Knapp patent"); and

Claim 20 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the Ueno patent as applied to claim 1, and further in view of U.S. Patent No. 6,252,571 to Nomura et al. (hereinafter the "Nomura patent").

Claim Amendments

Claims 1, 2, 8, 10, and 15 have been amended to solely improve the form thereof. These changes are not necessitated by the prior art, are unrelated to the patentability of the invention over the prior art, and do not introduce any new matter.

35 U.S.C. § 112

The rejection of claim 18 under the second paragraph of 35 U.S.C. § 112, because the definition of the phrase "a two-value image" is not clearly stated in the claim, is respectfully traversed based on the following.

The phrase "two-value image" is referred to and adequately described in the present specification at page 5, lines 7-17 and at page 28, lines 23-27 and page 29, lines 1-13, with reference to the Phase Transition Drive Method of the presently claimed invention. Thus, the specification provides adequate support and definition for the phrase "two-value image".

Accordingly, it is respectfully requested that the rejection of claim 18 under the second paragraph of 35 U.S.C. § 112 be reconsidered and withdrawn.

35 U.S.C. § 103(a) Rejections

Claims 1, 8-11, and 19

The rejection of claims 1, 8-11, and 19 under 35 U.S.C. § 103(a), as being unpatentable over the Ueno patent, is respectfully traversed based on the following.

Claim 1 requires a display device comprising a liquid crystal display having a liquid crystal material; a driver for driving the liquid crystal display; and a controller for controlling the driver to drive at least a part of the liquid crystal display by selectively using one of a first drive method and a second drive method which are different from each other in operational principle of said liquid crystal material.

The Office Action states that the Ueno patent discloses a controller, as required in claim 1, at column 3, lines 10-12 and lines 14-20 of the Ueno patent. Column 3, lines 10-12 of the Ueno patent discloses a first driving method for a liquid crystal display that is disclosed in a first publication, column 3, lines 14-20 of the Ueno patent discloses a second driving method that is disclosed in a second publication, and the Ueno patent even discloses a third driving method which is described in a third publication. However, the Ueno patent does not disclose or suggest a device which drive at least a part of a single liquid crystal display by selectively using one of the first drive method and the second drive method. The Ueno patent merely describes different conventional drive methods that have been put forth in different disclosures. The Ueno patent neither discloses nor

suggests a device which utilizes these drive methods together, or a device which selectively utilizes different ones of the drive methods described.

Therefore, the Ueno patent does not disclose or suggest all of the requirements of claim 1. Specifically, the Ueno patent does not disclose or suggest a device including a controller for controlling the driver to drive at least a part of the liquid crystal display selectively using one of a first drive method and a second drive method which are different from each other in operational principle of the liquid crystal material.

Claim 19 depends from claim 1. Therefore, the arguments for claim 1 are equally applicable for claim 19. Accordingly, claim 19 is also not rendered obvious by the Ueno patent.

Claim 8 requires a display device including a controller for controlling the drive to drive at least a part of the liquid crystal display by selectively using one of a first drive method and a second drive method wherein low contrast formation of an image on the liquid crystal display is possible by using the first drive method and high contrast formation of an image on the liquid crystal display is possible by using the second drive method.

As stated previously, in the argument for claim 1 over the Ueno patent, the Ueno patent does not disclose or suggest a controller which controls a driver to drive at least a part of the liquid crystal display by selectively using one of a first drive method and a second drive method. With respect to claim 8, the Office action states that column 7, lines 53-67 and column 8, lines 4-6 of the Ueno patent teaches a controller which meets the requirements of claim 8. In reviewing the cited portions of the Ueno patent, column 7, lines 53-67 of the Ueno patent discloses a first technique for a line-sequential driving method that is disclosed in a first group of publications and a second technique for a line-sequential driving method that is disclosed in a second group of publications. Column 8, lines 4-6 of the Ueno patent only discloses that one effect of the first technique of driving is that transmittance of the entire liquid crystal panel is reduced, thereby reducing its contrast ratio. However, the Ueno patent does not disclose or suggest using the first

technique disclosed in the first group of publications together with the second technique disclosed in the second group of publications, or a driver to drive at least part of a liquid crystal display by selectively using one of the first technique and the second technique.

Therefore, as was the case for claim 1, the Ueno patent does not disclose or suggest a controller for controlling a driver to drive at least part of the liquid crystal display by selectively using one of a first drive method and a second drive method. As this feature is an express requirement of claim 8, the Ueno patent could not render claim 8 obvious.

Claim 9 depends from claim 8. Therefore, claim 9 is also not rendered obvious by the Ueno patent.

Claim 10 requires a display device comprising a liquid crystal display which is capable of keeping an image having been formed thereon without consuming electric power; a driver for driving the liquid crystal display; and a controller for controlling the driver to drive the liquid crystal display a plurality of times to form at least one image in at least one portion of the liquid crystal display by repeatedly scanning the at least one portion.

Contrary to the requirement of claim 10, the Ueno patent does not disclose a device with a liquid crystal display which is capable of keeping an image having been formed thereon without consuming electric power. Therefore, although the Ueno patent discloses a driving method in which a plurality of low level scanning pulses are used to drive a liquid crystal device, the Ueno patent does not teach or suggest the use of this type of drive in a liquid crystal device having a liquid crystal which is capable of keeping an image having been formed thereon without consuming electric power. Therefore, the Ueno patent could not render claim 10 obvious.

Claim 11 depends from claim 10. Therefore, claim 11 is not rendered obvious by the Ueno patent.

Accordingly, it is respectfully requested that the rejection of claims 1, 8-11, and 19 under 35 U.S.C. § 103(a), as being unpatentable over the Ueno patent, be reconsidered and withdrawn.

Claims 2-7 and 12-14

The rejection of claims 2-7 and 12-14 under 35 U.S.C. § 103(a), as being unpatentable over the Ueno patent as applied to claim 1, and further in view of the Huang patent, is respectfully traversed based on the following.

Each of claims 2-7 depends from claim 1. As stated above, the Ueno patent does not disclose a controller, as required by claim 1, for controlling a driver to drive at least a part of a liquid crystal display by selectively using one of a first drive method and a second drive method which are different from each other in operational principle of the liquid crystal display.

Similarly, the Huang patent also does not disclose or suggest a controller for controlling a driver to drive at least a part of a liquid crystal display by selectively using one of a first drive method and a second drive method which are different from each other in operational principle of the liquid crystal display. Therefore, each of the Ueno patent and the Huang patent fail to disclose a controller which meets the requirements of claim 1. Thus, there is no combination of the Ueno patent and the Huang patent that discloses or suggests the controller of claim 1. Claim 1 is, therefore, not rendered obvious by any of the Ueno patent, the Huang patent, or any combination of the two. Because claims 2-7 depend from claim 1, each of claims 2-7 could not be rendered obvious by any of the Ueno patent, the Huang patent, or any combination of two.

Claims 12-14 depend from claim 10. As stated above, the Ueno patent does not disclose a controller, as required by claim 10, for controlling a driver to drive a liquid crystal display a plurality of times to form at least one image in at least one portion of the liquid crystal display by repeatedly scanning the at least one portion, wherein the liquid crystal display is capable of keeping an image having been formed thereon without

consuming electric power. Instead, the Ueno patent teaches a device for a liquid crystal display that requires electric power to be maintained. Thus, the Ueno patent does not disclose or suggest a controller, as recited in claim 1, which would be operable for a liquid crystal display which is capable of keeping an image having been formed thereon without consuming electric power.

Although the Huang patent does disclose a liquid crystal display capable of keeping an image having been formed thereon without consuming electric power, the Huang patent does not disclose or suggest a controller for controlling a driver for driving the liquid crystal display a plurality of times to form at least one image in at least one portion of the liquid crystal display by repeatedly scanning the at least one portion.

Therefore, neither the Ueno patent nor the Huang patent discloses or suggests a device with a liquid crystal display which is capable of keeping an image having been formed thereon without consuming electric power that is controlled by a controller for controlling a driver for driving the liquid crystal display a plurality of times to form at least one image in at least one portion of the liquid crystal display by repeatedly scanning the at least one portion. Moreover, one of ordinary skill in the art finds no motivation of objective reason to combine the Ueno patent and the Huang patent, to provide the device that is presently claimed, in either of the Ueno patent or the Huang patent. Therefore, claim 10 could not be rendered obvious by any of the Ueno patent, the Huang patent, a combination of the two. Claims 12-14 depend from claim 10. Therefore, claims 12-14 are also not rendered obvious by any of the Ueno patent, the Huang patent, or a combination of the two.

Accordingly, it is respectfully requested that the rejection of claims 2-7 and 12-14 under 35 U.S.C. § 103(a), as being unpatentable over the Ueno patent as applied to claim 1, and further in view of the Huang patent, be reconsidered and withdrawn.

Claim 15-17

The rejection of claim 15-17 under 35 U.S.C. § 103(a), as being unpatentable over the Ueno patent taken with the Huang patent as applied to claim 14, and further in view of the Knapp patent, is respectfully traversed based on the following.

Claim 15 depends from claim 10. As shown above, neither the Ueno patent nor the Huang patent discloses or suggests a device with a liquid crystal display which is capable of keeping an image, having been formed thereon, without consuming electric power that is controlled by a controller for controlling a driver for driving the liquid crystal display a plurality of times to form at least one image in at least one portion of the liquid crystal display by repeatedly scanning the at least one portion. As this is an express requirement of claim 10, the combination of the Ueno patent and the Huang patent could not render claim 10 obvious.

In a similar manner, the Knapp patent also does not disclose or suggest a device with a liquid crystal display which is capable of keeping an image, having been formed thereon, without consuming electric power that is controlled by a controller for controlling a driver for driving the liquid crystal display a plurality of times to form at least one image in at least one portion of the liquid crystal display by repeatedly scanning the at least one portion. Thus, the combination of the Ueno patent, the Huang patent and the Knapp patent fails to disclose or suggest all of the requirements of claim 10. As claim 15 depends from claim 10, claim 15 is not rendered obvious by any of the Ueno patent, the Huang patent, the Knapp patent, or any combination thereof.

Claim 16 requires the following:

A method for driving a liquid crystal display having a plurality of scan electrodes and a plurality of data electrodes, said method comprising the steps of:

(a) addressing a plurality of said scan electrodes and a plurality of said data electrodes to reset an area of said liquid crystal display defined by the plurality of scan electrodes and the plurality of data electrodes;

(b) addressing at least some of said plurality of said scan electrodes sequentially;

- (c) addressing selected ones of said data electrodes synchronizing with the sequential addressing of the scan electrodes in the step (b) to form an image; and
- (d) improving a contrast of said image by repeating the steps (b) and (c) a plurality of times without interposing the step (a).

Claim 17 requires the following:

- A method for driving a liquid crystal display having a plurality of scan electrodes and a plurality of data electrodes, said method comprising the steps of:
- (a) addressing at least some of said plurality of scan electrodes sequentially;
 - (b) addressing, in accordance with image data, said data electrodes synchronizing with the sequential addressing of the scan electrodes in the step (b) to form an image;
 - (c) improving a contrast of said image by repeating the steps (a) and (b) a plurality of times; and
 - (d) displaying an image that corresponds to said image data on said liquid crystal display without applying electrical voltage to any one of said scanning electrodes and data electrodes.

Although, the Office Action correctly acknowledges that the Ueno patent taken with the Huang patent does not teach any of the requirements of the methods recited in claims 16 and 17; the Office Action further states that the combination of the Knapp patent with the Ueno patent and the Huang patent renders claims 16 and 17 obvious. However, none of the cited references, namely, the Ueno patent, the Huang patent, or the Knapp patent, discloses or suggests a method including improving a contrast of an image by repeating addressing of scan electrodes and data electrodes. In particular, although the Knapp patent does disclose forming an image by applying a scanning signal to row conductors 16 (Fig. 1) and data signals to column conductors 17 (Fig. 1), the Knapp patent does not disclose or suggest improving a contrast of an image that is formed by repeating addressing of scan electrodes and data electrodes.

Therefore, because all of the cited references fail to disclose or suggest improving the contrast of an image formed on a display by repeating scanning of data electrodes and scan electrodes, as required by each of claims 16 and 17, claims 16 and 17 are each distinguished and nonobvious over the cited references.

Accordingly, it is respectfully requested that the rejection of claim 15-17 under 35 U.S.C. § 103(a), as being unpatentable over the Ueno patent taken with the Huang patent as applied to claim 14, and further in view of the Knapp patent, be reconsidered and withdrawn.

Claim 20

The rejection of claim 20 under 35 U.S.C. § 103(a), as being unpatentable over the Ueno patent as applied to claim 1, and further in view of the Nomura patent, is respectfully traversed based on the following.

Claim 20 depends from claim 1. As described above in the argument for claim 1, the Ueno patent does not disclose or suggest a controller for controlling the driver to drive at least a part of the liquid crystal display by selectively using one of a first drive method and a second drive method which are different from each other in operational principle of the liquid crystal material. As this feature was required by claim 1, the Ueno patent could not render claim 1 obvious.

Similarly, the Nomura patent fails to disclose or suggest a controller for controlling the driver to drive at least a part of the liquid crystal display by selectively using one of a first drive method and a second drive method which are different from each other in operational principle of the liquid crystal material. Therefore, no combination of the Ueno patent and the Nomura patent discloses or suggests all of the requirements of independent claim 1. As claim 20 depends from claim 1, claim 20 is also distinguished and nonobvious over the combination of the Ueno patent and the Nomura patent.

Accordingly, it is respectfully requested that the rejection of claim 20 under 35 U.S.C. § 103(a), as being unpatentable over the Ueno patent as applied to claim 1, and further in view of the Nomura patent, be reconsidered and withdrawn.

New Claim 21

Claim 21 has been added to depend from claim 1. Accordingly, the foregoing remarks regarding the distinguishing and nonobvious features of claim 1 over the cited references are equally applicable to claim 21. Accordingly, claim 21 is distinguished and nonobvious over the cited references.

CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment does not increase the number of independent claims, but increases the total number of claims by 1 to 21 from 20, and does not present any multiple dependency claims. Accordingly, a Response Transmittal and Fee Authorization form authorizing the amount of \$18.00 to be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260 is enclosed herewith in duplicate. However, if the Response Transmittal and Fee Authorization form is missing, insufficient, or otherwise inadequate, or if a fee, other than the issue fee, is required during the pendency of this application, please charge such fee to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260.

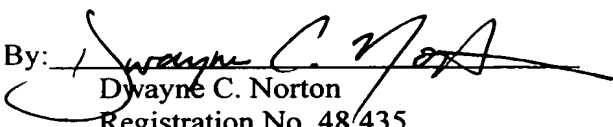
Any fee required by this document other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

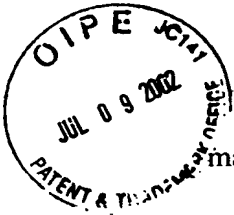
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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE



The following is a marked-up version of the changes to the claims which are being made in the attached response to the Office Action dated April 3, 2002.

IN THE CLAIMS:

1. (Once Amended) A display device comprising:
a liquid crystal display having a liquid crystal material;
a driver for driving said liquid crystal display; and
a controller for controlling said driver to drive at least a part of said liquid crystal display by selectively using one of either a first drive method and a second drive method which are different from each other in operational principle of said liquid crystal material.
2. (Twice Amended) A display device according to claim 1, wherein the said liquid crystal display is capable of keeping an [image]image, having been formed [thereon]thereon, without consuming electric power.
8. (Twice Amended) A display device comprising:
a liquid crystal display having a liquid crystal material;
a driver for driving said liquid crystal display; and
a controller for controlling said driver to drive at least a part of said liquid crystal display by selectively using one of either a first drive method and a second drive method, wherein:
low contrast formation of an image on said liquid crystal display is possible by using said first drive method; and
high contrast formation of an image on said liquid crystal display is possible by using said second drive method.

10. (Twice Amended) A display device comprising:
a liquid crystal display which is capable of keeping an ~~[image]~~image, having been formed ~~[thereon]~~thereon, without consuming electric power;
a driver for driving said liquid crystal display; and
a controller for controlling said driver to drive said liquid crystal display a plurality of times to form at least one image in at least one portion of said liquid crystal display by repeatedly scanning said at least one portion.

15. (Twice Amended) A display device according to claim 14, wherein said controller is capable of controlling said driver so as to execute the steps of:

(a) addressing a plurality of said scan electrodes and a plurality of said data electrodes to reset an area of said liquid crystal display defined by the plurality of scan electrodes and the plurality of data electrodes;

(b) addressing ~~[a plurality of scan electrodes]~~at least some of said plurality of said scan electrodes sequentially;

(c) addressing selected ones of said data electrodes synchronizing with the sequential addressing of the scan electrodes in the step (b); and

(d) repeating the steps (b) and (c) a plurality of times without interposing the step (a).

16. (Once Amended) A method for driving a liquid crystal display having a plurality of scan electrodes and a plurality of data electrodes, said method comprising the steps of:

(a) addressing a plurality of said scan electrodes and a plurality of said data electrodes to reset an area of said liquid crystal display defined by the plurality of scan electrodes and the plurality of data electrodes;

(b) addressing ~~[a plurality of scan electrodes]~~at least some of said plurality of said scan electrodes sequentially;

(c) addressing selected ones of said data electrodes synchronizing with the sequential addressing of the scan electrodes in the step (b) to form an image; and

(d) improving a contrast of said image by repeating the steps (b) and (c) a plurality of times without interposing the step (a).

17. (Once Amended) A method for driving a liquid crystal display having a plurality of scan electrodes and a plurality of data electrodes, said method comprising the steps of:

(a) addressing [a plurality of scan electrodes] at least some of said plurality of scan electrodes sequentially;

(b) addressing, in accordance with image data, said data electrodes synchronizing with the sequential addressing of the scan electrodes in the step (b) to form an image;

(c) improving a contrast of said image repeating the steps (a) and (b) a plurality of times; and

(d) displaying an image that corresponds to said image data on said liquid crystal display without applying electrical voltage to any one of said scanning electrodes and data electrodes.